WU: Solve the system using an inverse matrix $(A^{-1}B = X)$

$$-1.5x = -30$$

$$2x - 3y = 10$$

$$[A]^{-1} \cdot [B] = \begin{bmatrix} x \\ y \end{bmatrix} \quad \begin{bmatrix} -1.5 & 0 \\ 2 & -3 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -30 \\ 10 \end{bmatrix}$$

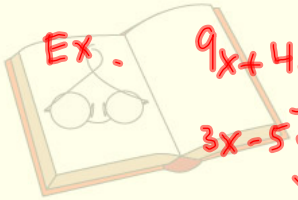
$[A]$ $[X]$ $[B]$

Solve a system using Cramer's Rule

$$ax + by = e$$
$$cx + dy = f$$

$$A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$$

$$x = \frac{\begin{vmatrix} e & b \\ f & d \end{vmatrix}}{\det A} \qquad y = \frac{\begin{vmatrix} a & e \\ c & f \end{vmatrix}}{\det A}$$



Ex. $9x + 4y = -6$
$3x - 5y = -21$

$ax + by = e$
$cx + dy = f$

① $\det A = \begin{vmatrix} 9 & 4 \\ 3 & -5 \end{vmatrix} = 9 \cdot -5 - 3 \cdot 4 = -45 - 12$

$\det A = -57$

② $x = \dfrac{\begin{vmatrix} -6 & 4 \\ -21 & -5 \end{vmatrix}}{\det A} = \dfrac{-6 \cdot -5 - -21 \cdot 4}{\det A}$

$= \dfrac{30 + +84}{\det A} = \dfrac{114}{-57}$

$x = -2$

③ $y = \dfrac{\begin{vmatrix} a & e \\ c & f \end{vmatrix}}{\det A} = \dfrac{\begin{vmatrix} 9 & -6 \\ 3 & -21 \end{vmatrix}}{-57} = \dfrac{9 \cdot -21 - 3 \cdot -6}{-57}$

$= \dfrac{-189 + +18}{-57}$

$y = \dfrac{-171}{-57} = 3$

$3x-4y=-15$

$2x+5y=13$

$X=\dfrac{\begin{vmatrix} e & b \\ f & d \end{vmatrix}}{\det A}$

$y=\dfrac{\begin{vmatrix} a & e \\ c & f \end{vmatrix}}{\det A}$

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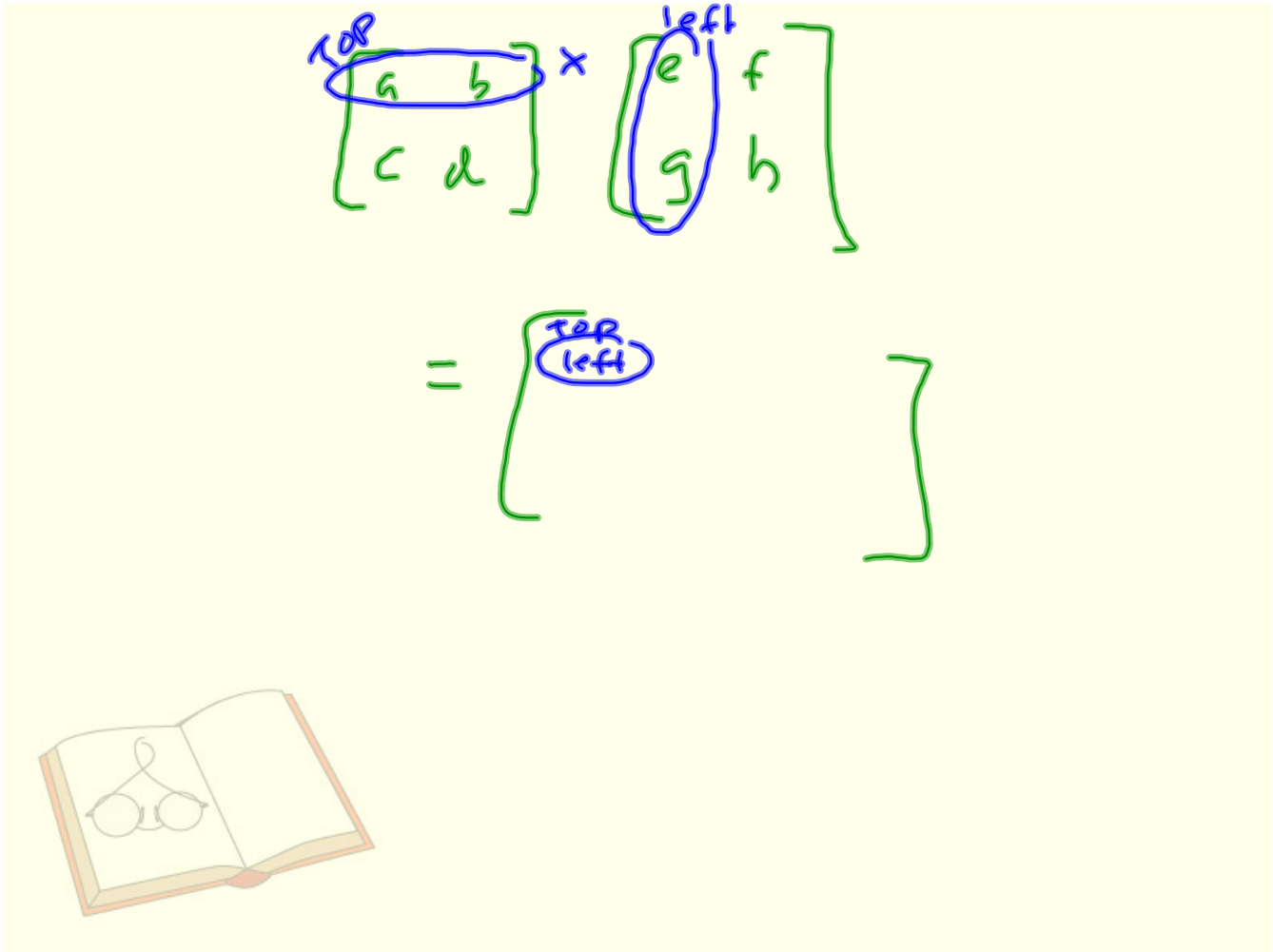
$\begin{vmatrix} 3 & -4 \\ 2 & 5 \end{vmatrix} = 15 - -8 = 23$

$X=\begin{vmatrix} -15 & -4 \\ 13 & 5 \end{vmatrix} = \dfrac{-15\cdot 5+4\cdot 13}{-23} = \dfrac{-23}{23} = -1$

$Y=\begin{vmatrix} 3 & -15 \\ 2 & 13 \end{vmatrix}$ $3\cdot 13-2\cdot -15$ $39+30=\dfrac{69}{23}=3$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